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ABSTRACT

What constitutes a region? In what ways do people define or construct the regions in which they live and work? This paper presents findings of a case study of a regional watershed partnership that examined the social ecological processes of social construction-in-action. The study sought to examine how a major watershed's educators collaborated to coconstruct a regional partnership and to determine whether these processes reflected a broader social construction of "watershed-as-region." If so, that would mean that collaborative efforts among regional partners had established a greater sense of coherence than other existing constructs, either political or spatial. The study spanned an 18-month period, tracing conceptual changes in individual participants' perspectives about region and partnership. The social constructs of "watershed" and "partnership" were examined through participant observation, two sets of interviews with each of the eight participants, and analysis of participants' geographic representations. Participants were asked during the interviews to produce graphic representations, or sketch maps, of the partnership. The findings indicate that cognitive representations of watershed region are influenced by persistent political boundaries and that the tension between natural and political boundaries remained even while collaborative efforts were in process. However, no organization or individual dominated the partnership process. Ten figures and two tables are included. (Contains 59 references.) (LMI)

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REDEFINING REGION; SOCIAL CONSTRUCTION IN A REGIONAL WATERSHED EDUCATION PARTNERSHIP

Marsha Alibrandi, University of Massachusetts/Amherst

Paper presented at the Annual Meeting of the American Educational Research Association, April 8-12, 1996, New York, NY

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Summary:

This qualitative case study of a regional watershed education partnership examines the social ecological processes of social construction-in-action. The study spans an eighteen-month period, tracing conceptual change in individual participants' perspectives on region and on partnership. Social constructs of watershed and partnership are analyzed through participant observation at partnership meetings, field notes, individual interviews, and participants' graphic representations, processes and products.

Data sources for the study include audiotaped meetings and interviews, meeting documentation, written communication and telecommunications, and participant-produced representations. From transcript and representational data, are drawn evidence of social-ecological effects in the social construction of watershed-as-region, place, and collaboration in a regional partnership. Implications of the study indicate that "overcoming boundaries" and balancing equity and responsibility are both priority and problematic in establishing regional watershed collaboratives.

Introduction

What constitutes a region? In what ways do people define or construct the regions in which they live and work?

This study focused upon conceptual change in teachers'[1] beliefs about watershed-as-region and their participation in a regional watershed education partnership.

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[1] Here, I use the term "teachers" to refer to the participants in the environmental education initiative. These participants would more frequently identify themselves as "environmental educators" primarily because they are not teachers, but providers working in various agencies and organizations outside "formal" school settings. They work in museums, nature centers, non-profit, federal, and state agencies. Yet the literature on teachers' beliefs is relevant to this discussion, and will be used interchangeably with the term "educator".

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Concepts of "region" are quite essentially social constructs. Perhaps "bigger" than "communities;"[2] sometimes smaller and sometimes larger than national boundaries, regions are nonetheless socially constructed from interrelated layers of geographic, prehistoric, historic, cultural (linguistic, religious), economic, and political identifications. How the partners construct meaning about watershed-as-region and about participation in a regional partnership is the central problem in the study.

Background of the Problem:

How do watershed educators in a regional partnership collaborate to meet their goals, and how does their process reflect a broader social construction of watershed-as-region?

Environmental education providers from different parts of the Connecticut River watershed region participated in a one-year project that sponsored teacher education workshops demonstrating and disseminating watershed curricula, resources, and "hands-on" teaching techniques. Among the goals of the one-year project (hereafter referred to as "Phase I") were to develop an educational network throughout the watershed. In addition, the Phase I project offered watershed teacher education workshops, co-developed curriculum with the region's teachers and educators, facilitated partnerships between schools and federal, state, local and community agencies and organizations, and established a telecommunication newsgroup for regional communication.

Much of environmental teacher education is done in "informal" in-service workshop settings. (Lane et al, 1994). Most of the study participants had served as providers and presenters in Phase I Teacher Education workshops. The shift to Phase II occurred when many of the provider/presenters furthered the scope of the Phase I project by asking their colleagues to begin to develop a more cohesive and sustainable partnership for the purpose of concentrating educational efforts on behalf of the entire Connecticut

[2] "Community" has in the last decade of North American usage taken on a greater social dimension than its previous meaning which had a spatial dimension. "Community" has moved beyond neighborhood or district to reflect any of many groups of people with whom one is associated, or with whom certain attributes are shared. "Region" however retains its spatial significance, although it is a highly inexact reference, prone to considerable social reconstruction.

River, which flows through the four New England states of Vermont, New Hampshire, Massachusetts, and Connecticut.

Educators from federal and state agencies, utilities, and non-government/non-profit organizations thus began to meet to discuss future collaboration and program development. Initial concerns of the partners were to prioritize goals and objectives, and to construct a mission statement. Next came the problem of creating a structure to serve the functions of the group. Later, structural concerns were abandoned for the commencement of a collaborative project, as the partners moved, in their words, from "talking about it" to "*do*ing it."

Objectives:

The purpose of the study was to examine how a major watershed's educators collaborate to co-construct a regional partnership, and how their processes may reflect broader social construction of watershed-as-region. Data for the study was generated for the purpose of tracing conceptual change in the partners' interpretations of watershed-as-region, place, partnership, and collaboration. These were interpreted for evidence of an emergent social ecology.

Responsibility for identification of environmental impacts and natural resource restoration has fallen largely upon government and non-profit agencies. In addressing environmental issues and problems, these agencies have recognized land and water pollution as watershed-locatable phenomena[3] (EPA, 1992). Although watershed-as-region may have little meaning to many citizens, regional environmental educators have assumed the responsibility of collaborating to promote the related scientific and civil skills and understandings for improving public and ecological health.

Educators representing different geographic territorial regions are in the process of developing a partnership. The partners are employed by the region's federal and state agencies, schools, non-profit organizations, and utilities, each with their own goals, missions, programs, and responsibilities. These responsibilities include such diverse

[3] This not to say that the impacts of land and water pollution are confined to the watershed of origin, nor that the sources of that pollution are necessarily located in that watershed; i.e. acid rain, is airborne pollution that is carried on wind currents, and falls in weather patterns sometimes hundreds or thousands of miles away. The issue here is the location of pollution for the purpose of intervention, and with study, possible prevention.

interests as electric power generation, endangered species protection, natural resource protection and restoration, water quality and water supply, education, hunting and fishing, pollution prevention, control, and regulation, and EPA data generation. The common unity shared by the various partners is their location within the Connecticut River watershed, and their work as relevant to the river.

In their initial meeting (Alibrandi: field notes, 5/13/94), the partners supported a stated desire to "overcome boundaries" in their collaborative effort. That they recognized and articulated the existence of such "boundaries" and their desire to collaborate to "overcome" them indicates that such boundaries may exist in practice as well as in political space. Since the nature of water in a watershed shuns political boundaries, the efforts and involvement of the partners in a watershed education initiative may reflect the broader need for regional collaboration. To better explain the complexity of these interests, the study examined the partners' representations of spatial and social processes as a means of comparing conceptual and organizational change over time.

Perspectives

Theory and empirical research in spatial cognition and environmental perception indicate strong and persistent images of region in individual cognitive maps (Gould & White, 1976). Particularly persistent are political boundaries and local "sub-regional" identifications that function as settings for home, work, educational and recreational activities (Lynch, 1960; Downs & Stea, 1976; Saarinen, 1988; Garreau, 1981). As federal initiatives promote regional collaboration among a watershed's agencies, traditional geographic purviews can become fractured, condensed, compressed, or overlapped and shared in different configurations. At state administrative levels, negotiations, adjustments, and collaboration in bureaucratic units and agencies are involved in "restructuring" along watershed lines, rather than along political boundaries (Merrimack River Watershed Conference, 1993; 1994). It is within this larger systemic cultural change that the partnership and this study are located.

Included in this process, environmental educators find themselves interpreting watershed concepts in teacher education workshops, in schools, and in public education

programs. Curriculum and in-service programs, funded by federal and state initiatives have encouraged and supported this focal shift (EPA, 1991; Mitchell & Stapp, 1995; NWREEC, 1994; Waters, 1995, Sivret, 1995). Therefore, in the process of providing this additional layer of environmental and teacher education, the partners are also involved in developing this partnership to support their own goals. Thus, how the partnership evolves its functional social ecology may provide insight into changing notions of regional collaboration, especially along watershed lines. From this perspective, I hoped to examine some of the elements of social construction in what John Shotter calls a "social ecology" (Shotter, 1993).

Definitions

Defining Partnership

Using the typology of Partnership Structure as described by the US Department of Education's Office of Educational Research and Improvement (OERI), this partnership would fall into the category, "*complex*." In their report "Synthesis of Existing Knowledge and Practice in the Field of Educational Partnerships" (OERI, 1993), OERI distinguishes the complex partnership from the *simple* and *moderately complex* types in this way:

> The *moderately complex* partnership involves any of three arrangements: shared management or decision-making among two or more partners; multiple partners, each with substantive program responsibility; or more than one partner within each sector...A *complex* partnership has the characteristics of a moderately complex partnership plus one or more of the following characteristics: two or more levels of partnership in the project; a new organization formed for the purposes of the project; or multiple partners from two or more sectors...An important point in considering the value of this typology is that the terms refer only to the structure of the partnership and do not correspond to the level of complexity of the project's goals or objectives. (9).

As the partnership continues to meet and develop its function within the region, more specific impacts will be identified and described. As the partnership approaches its second year the partners have met as a large group on six occasions with interim meetings and activities among smaller combinations of partners.

Defining and Redefining Region

> "We may view regions as an intermediate step between our knowledge of local places and our knowledge of the entire planet. Eventually they help us to see the earth as an integrated system of places that we can comprehend as a planetary ecosystem." (Natoli et al, 1984, p 8).

> "Each of us is a small contingent creature with ancestors, family, community, and place. The place is really a part of the larger community--it is a watershed, a big family of plants, birds, and animals, a configuration of flats or slopes--it is the territory in and on which we live." (Snyder in Hardwick & Holtgrieve, 1990, p. 83).

In a way, the act of defining region might seem to contradict the contention of this study that regions are necessarily social constructs. Yet the unity that connects the partners in this partnership is the geographic region, the Connecticut River watershed. Although the definition that best supports the study is one agreed upon by geographers, it is important to acknowledge the ephemeral and indefinite nature of the term "region."

Geographers use regions as units of study for a variety of study purposes. In their influential "Guidelines for Geographic Education in Elementary and Secondary Schools," professional geographers from the Association of American Geographers and the National Council for Geographic Education ranked regions as the fifth of the "Five Themes of Geography" which have greatly influenced the proliferation of geography curriculum since its publication (Natoli et al, 1984). They define region this way: "The basic unit of geographic study is the region, an area that displays unity in terms of selected criteria." Building upon that definition, Hardwick and Holtgrieve (1990) add,

> "Thus, the criterion chosen to define a particular region will determine the usefulness of the concept. Regions may be based on criteria such as physical, cultural, social, political, or urban characteristics. The chosen characteristics set aside this area from others surrounding it" (344).

Hardwick and Holtgrieve further describe the formal/functional distinctions between regional definition as the difference between formal political boundaries and a region as "identified by its activities, interconnections, and usefulness."

As the partners come to define the watershed region and their participation within the partnership, they must necessarily construct an understanding of these interconnections

and activities in the process of learning about one another and the region. It is this collaborative learning process that I were examine in this study.

Defining Watershed as Region

In the current decade, in nations that have prioritized environmental health goals and policies, some agencies have moved toward regional definitions as determined by ecological factors. The United States Environmental Protection Agency, and other agencies of the US Department of the Interior (USDOI) have identified watershed regions as the planning units of choice (EPA, 1992). This movement is largely a result of the complications of trying to solve the complex problems of non-point source pollution (or pollution from diffuse, as opposed to specifically identifiable, locatable "point" sources of origin). In order to understand and develop solutions for pollution problems of this nature and magnitude, entire drainage systems; both surficial and subsurficial, must be evaluated and treated as conceptual and physical wholes.

> The watershed protection approach is an integrated, holistic strategy for more effectively restoring and protecting aquatic ecosystems and protecting human health (e.g. drinking water supplies and fish consumption). This approach is a renewed effort by the US Environmental Protection Agency (EPA) to focus on hydrologically defined drainage basins--watersheds--rather than on areas arbitrarily defined by political boundaries. Thus, for a given watershed, the approach encompasses not only the water resource, such as a stream, river, lake, estuary, or aquifer, but all the land from which water drains to that resource. To protect water resources, it is increasingly important to address the condition of land areas within the watershed because as water drains off the land it carries with it the effects of human activities throughout the watershed. By concentrating on natural resources and systems, it is possible to detect and take remedial action for such problems as declines in living resources and habitat loss (EPA 1992).

The watershed-as-region concept thus facilitates the application of environmental problem-solving in cases of land and water pollution, yet the pre-existence of political boundaries can confound such problem-solving efforts. The political and social institutions under whose purview public health and safety and environmental protection fall have been traditionally bounded by state, county, and municipal political structures. Therefore any watershed-based partnerships or organizations require a reconfiguration of previously

unconnected entities. Thus the partnership reflects some of the dynamics of organizational changes occurring nationwide in order to address nonpoint source pollution issues.

Defining Social Construction

To locate the partnership project as a social construct within the context of a broader discourse, I refer to the work of John Shotter (1993) and Michel Foucault (1972). In his Archeology of Knowledge, Foucault unearths the more dynamic processes of the coalescence of what he calls the "unities of discourse" as distinct from the predeterministic labels of "threshold events" when a sudden insight changed the destiny of human thought and action. Foucault finds such descriptions rigid and dependent upon a reflective perspective on evidence from the past (1972). They do not describe the processes as they are occurring in the present, which are much more fluid. The more fluid influences Foucault identifies as the "unities of discourse" are those which, over time, gather into courses of coherence. He illustrates that "public statements" are indicators of the process of this coherence (1972).

When Rachel Carson sounded the ecological alarm in 1962, (Carson, 1962), "public statements" from local regions in the US, where species endangerment, water and pollution issues precipitated legal action, political action mounted. Since then, responses from the scientific community, especially in hydrology and geology (Strahler, 1964), and in ecology and biology, have added to the still-building evidence of pollution's effects. As findings on water quality degradation compounded, largely out of the work of the US Geological Survey (1984; 1985), so came an understanding that a "watershed approach" (USEPA, 1992; Coastal America, 1994) was most congruent with administering solutions to pollution problems. Therefore, the amassing of public statements and recognition's of regional water pollution problems led a wave of movement toward the conceptual-ideological social construct of watershed-as-region. From this construct have come the support for watershed initiatives of many kinds through existing state and regional agencies and partners.

In his Conversational Realities, John Shotter (1984) expands upon some of the specific processes involved in this transitional phase by identifying elements and influences

of socially constructed discourse. Shotter identifies some of the more fleeting elements in the process such as "feelings of tendency," risk-taking, and "knowledge-from-within," as individual contributions to the building coherency. These, too, played a part in the construction of the partnership in the way that Shotter explains these elements as necessary in order to "author" public statements. Shotter also presents a way of interpreting what he calls "joint action" which may be useful in interpreting some of the activities of the partnership. Shotter describes such a process as:

> "fashioning of a something which currently does not exist-- a new *civil society*, a whole 'social ecology' of interdependent regions and moments of social life within which *possible* ways into the future can be explored, discussed, and debated by those actually involved. For, as we have seen, in a social constructionist world, our future is not just a matter of prediction and control, but a matter of how those within it are involved in producing it" (Shotter, 1993, p.15).

I therefore locate the formulation of the partnership within Foucault's "unities of discourse", and more specifically within what Shotter would called "a landscape of enabling constraints" in which the partners facilitated the "next possible actions" and began to invite the "players" (Shotter, 1993, p. 149) to participate (see Figure 1. Phases of a Connecticut River Watershed education Partnership Project, 1993-95).

Methods

Qualitative methods of active participant observation (Spradley, 1980; Lincoln & Guba, 1993) in partnership meetings over an eighteen-month period were used. Audiotape recording and field notes on meeting interactions and exchanges are primary data sources. I conducted individual interviews with eight of the partners on two occasions; one set prior, and one set after a particular meeting (Meeting #6). The interviews were conducted as active interviews in which a set of predetermined questions were elaborated with emergent questions and related conversations (Holdstein & Gubrium, 1995). At the times of the interviews, two representational products were generated as documentation for conceptual change: these were sketch maps (Lynch, 1960) of the regions, and concept maps of the

partnership (Morine-Dershimer, 1993). Written products, distributed documents, seating arrangements, and chronologies were analyzed for emergent social and spatial patterns.

Individual interviews of the partners were conducted to elicit their perspectives and beliefs regarding ecology, region, collaboration, and environmental education. In addition, spatial representations were produced by each partner at two distinct time periods to determine changes occurring in the individuals' and group's conceptions and representations of the region. These products of both verbal and graphic representation were meant to supplement and triangulate with one another as companion techniques, and represent the primary data used in this study.

The period of fieldwork for this study occurred between May, 1995 and January, 1996. During this period, the general meetings, communications, and telecommunications were documented using field notes and by collecting communiqués and documents generated among the participants. Cross-case analysis of interview and representational data is the empirical basis for conclusions regarding the presence and/or emergence of a "social ecology."

Findings

The Participants:

This study necessarily focuses closely on the participants in the partnership. The dozen original partners are a group of educators representing four states, one federal agency, some non-profit organizations; and includes one classroom teacher. In Phase I, the partners had taken part in a one-year grant-funded program to establish a regional watershed network, and most were presenters at network teacher workshops in that year. The initial meeting of the group occurred at the end of the project's year, as the workshops had been held at different sites throughout the region, so although they had all participated in the same project, they had never met as a group.

In their first meeting, which marks the shift from Phase I to Phase II, the participants stated a desire to work "beyond boundaries." Because many are representatives of state agencies, this is a significant goal which implies that the emergent organization would somehow supersede existing boundaries. Because of the rigidity and bureaucratic barriers of state administrations, it appears that the participants also have a strong goal of collaborating equitably. Therefore, the ways in which participants share responsibility, authority, resources, and power within the group may become an analogy for the way the partnership operates. Through professional organizations and meetings, many of the partners have shared previous associations, collaborations, and common work experiences.

In this application of the literature of social construction, I inevitably locate myself as a participant observer. I continue to be a player in this landscape, but so far, it is a landscape in a region that is not my own; I have come from another region, and seeing the possibility, wished to facilitate the creation of this 'landscape' for action. Yet the commitment of the players about whom I will come to know more, and with whom I will "explore, discuss, and debate," (Shotter: 149) are the natives of this region, and there, I believe, lies some sort of principal, critical difference; that their knowledge from within is deeply rooted and located in this place that they may come to describe and construct as the Connecticut River watershed.

As a participant observer (Spradley, 1980) I must locate myself, "MA" in the partnership. As a participant, perhaps my most influential contribution was to contact people in the four state region to participate in Meeting #1 (see Figure 1. Phases of a Connecticut River Watershed education Partnership Project, 1994-95, below).

One instance in which my role as an active participant (Atkinson, 1990) manifested in a group process was a micropolitical interaction of one minute and thirty-nine seconds in duration (Audiotape, CRWEI meeting #2, 9/20/94) in which I suggested to the partner on my left that, "We could rotate the facilitation." The intonation of the suggestion made it tentative in nature, but within the next minute and one half, the utterance was repeated around the table until it reached one of the male partners. That partner uttered the idea publicly, to the whole group, and effectively confirmed consensus. The way in which this suggestion moved spatially around the table suggests a diffusion strategy that eventually led to consensus.

Figure 1. Phases of a Connecticut River watershed education partnership project, 1993-95

**** Asterisks indicate Phase II activities**

April 15, 1993: Connecticut River Watershed Council ("CRWC") is awarded an EPA environmental education seed grant of $5,000 for fiscal year June 1993-June 1994

June 1, 1993 "The River That Connects Us" watershed education program offers **Phase I** teacher workshops throughout the four-state region

Oct. 2, 1993 Teacher Workshop, Hartford, CT

Oct. 23, 1993 Teacher workshop, Northfield Mountain Education & Recreation Center

Nov., 1993 Tributaries newsletter, Vol. 1, No. 1

Jan., 1994 Curriculum collaboration planning and coordination

Feb., 1994 Tributaries newsletter, Vol. 1, No. 2

March, 1994 Curriculum meeting/collaborative groups established

April 30, 1994 Teacher workshop, Norwich VT (VT/NH)

May, 1994 Tributaries newsletter, Vol. 1, No. 3

** May 13, 1994 **Phase II** begins with **1st meeting of CRWEI**, at Quabbin Reservoir

June, 1994 End of EPA grant

** July 27, 1994 **CRWEI Mission statement draft meeting**, Amherst, MA

August, 1994 Curriculum drafts submitted to EPA

** September, 1994 CB establishes watershed Newsgroup on K12 Internet teacher/student network

** Postings to Newsgroup: CB & CRWC (Appendix)

** September 20, 1994 **CRWEI Meeting #2**, at Northfield Mt. ERC, Northfield, MA

September, 1994 Tributaries newsletter Vol. 2, No. 1

** November 9, 1994 **CRWEI Meeting #3** at Montshire Museum, Norwich, VT

** MA email>CB/reply

January, 1995 Tributaries newsletter Vol. 2, No. 2

** Jan/Feb. 1995 Mail flow MA>CB; JL>CB; MA>ALL

** Telephone conversations: MA>MLC; CB>MA; MA>CB; CB>MA; CB>MA; CB>MA

** Mail flow CB>ALL

** February 9, 1994 **CRWEI Meeting # 4**, USFWS Regional Headquarters, Hadley, MA

Thus, it was through personal connections and participation in Phase I that the original partners came to meet to comprise the current group. The meeting grew out of a telephone conversation between two of the partners, and grew rapidly to include others from the four-state region by personal invitation over a ten day period. In the original meeting, the gender composition was ten women and 3 men. To subsequent meetings, other individuals were invited, but a priority on the development of mission, goals, and objectives derived from a brainstorm session in Meting #1 was undertaken before the group would address a more systematic recruitment strategy. The distribution of the sponsoring agencies of the participants is represented in Table 1., below.

Table 1. Participants in the Watershed Partnership

Name	Organization/	Job Title	Gender	Extent of region
MA	Ct. River (4-state) Watershed Council	Project Director, Env. Teacher Ed	F	Watershed region
CB	5-College Partshp/ USFWS Conte Refuge Plan Proj.	Telecomm. TE / EIS development	F	MA:local region/ Watershed region
LH	USFWS	Federal Aid Officer	F	Region (+)
EH	MADFW	Chief of Education	F	MA+: entire state + partner w/ NH on interstate watershed ed proj.
CJ* /> SL	NEIWPCC	Agent	F* later replaced by M	New England (4 states +)
JL	Quabbin/MDC	Naturalist, Educator	M	MA: local region
ML	MADFW	Env. TE	F	MA+; entire state + partner with NH on interstate watershed ed proj.
MLC	Ct RiverWatch	Agent: water quality testing	F	NH + VT: river creates common border
AM	CTDEP	Agent, TE; water quality testing	M	CT: entire state
KN	Northfield Mtn.	Env. Educator, Naturalist	F	MA: local region
LR	NHF&G	Env. Educator + TE	F	NH+; entire state plus partner w/ MA on interstate watershed ed proj.
(WS)	Ct River Watershed Council	Assoc. Director	F	Ct. River watershed region
SS	NH Teacher; Env Ed, Telecomm	NH Teacher Fellowship	F	NH: local region
TW	Hitchcock Env. Ctr.	Ed Spec + TE	M	MA: local region

To properly investigate the influences converging in the watershed partnership, individual resumes, transcripts, and other information relevant to the partners' current status in environmental education supplements the comments and representational products was elicited in interviews. In most cases, participation in the partnership extends the responsibilities and work required by these educators whose "plates are already full."

Some of the participants serve on committees in other regional environmental education organizations. Within the partnership, there are officers of the New England Environmental Educators, and the Massachusetts Environmental Education Society. Many of the participants are Project WILD and Aquatic WILD (NREEC, 1987) trainers who demonstrate national wildlife curriculum to in-service and pre-service teachers through dissemination workshops. It was through their participation in Project WILD that two of these environmental education (EE) providers networked to their fellows in invitations for the first meeting. A schematic of the flow of invitations is represented in Figure 2., below:

Figure 2. Flow of invitations to Meeting #1.

Telephone conversation

TW to EH

TW to ML chance meeting

TW & MA Telephone conversations

MA > TW,

MA > ML

ML > JL, LR, AM, EH, & others* LR>SS

MA > MLC, CB, CJ, JL, & others* JL>KN

LR > LH

* "others" who were unable to attend

The presence of a participant from the US Fish & Wildlife Service (USFWS) represents a new regional initiative seeking to establish a model end-of-the century wildlife refuge system in an area already supporting scattered human population centers. The USFWS Conte Refuge Planning Project in its three-year planning phase may come to represent a major player in the social construction of the watershed as a conceptual and actual, viable entity. By the event of the first meeting, CB had been hired to a position with the Conte project. The effect of this appointment on CB's interpretation of her role

in the partnership led her take on leadership functions as coordinator and disseminator of mailings. Her assumption of these responsibilities and the influence of the US Fish & Wildlife Service as a presence in the region may influence the dynamics of the partnership.[4]

Results/Conclusions

Spatial and Linguistic Representations

The stated objectives of the study were to examine how watershed educators co-construct a regional partnership, and how their social processes may reflect broader constructions of watershed-as region and regional collaboration. Through this examination, I collected documentation toward describing an emergent social ecology. The focus of the data gathered was to trace conceptual change in the partners' interpretations of region, place, collaboration, and partnership.

Finding evidence of such elusive properties as a social ecology "under construction" was perhaps facilitated by the elongated periods between partnership meetings, and by the distances between the partners in that their interactions were constrained by time and space. In an attempt to document conceptual change for qualities of an emergent social ecology, I focused upon the partners' concepts of region, place, collaboration and partnership as represented in both verbal and graphic products. This documentation is then used to develop conclusions regarding conceptual change and its possible relevance to or evidence of a social ecology.

In this section, I offer an analytical approach to the longitudinal use of spatial and graphic representations as illustrative of and companion to verbal representational data. In a previous paper, I compared graphic and verbal representations of similar phenomena as having corresponding functions when verbal and graphic representations are considered as products of two sets of communicative behavior, those being "language" and "spatial behavior" (Alibrandi, 1993a). While others have likened maps to language, I have found this comparison a mismatch in domains (Robinson & Petchenik, 1976; Andrews, 1990).

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[4] Indeed, one of the earliest spatial/conceptual representations of possible CRWEI structure was profferred by CB at the July, 1994 meeting.

Rather, I have proposed that when "language" and "spatial behavior"[5] are viewed as parallel but separate sets of communicative operations, their related products may serve as indicators of inner states. I base this comparison upon the work of Howard Gardner (1983) in which he describes "Multiple Intelligences." The two sets I compare here, then, may be seen as the products of two different "intelligences" corresponding to the "linguistic intelligence" and the "spatial intelligence" identified by Gardner (1983).

The assumption of corresponding functions of these intelligences and their products underlies the landmark work of Kevin Lynch, who in 1960 gathered hundreds of sketch maps and verbal descriptions of various cities and neighborhoods for use in urban planning. Since Lynch's seminal work, countless studies in spatial analysis have analyzed thousands of "mental maps" (or sketch maps, or cognitive maps) as data for planning and market research (Gould & White, 1976; Downs & Stea, 1976; Saarinen, 1988). In Lynch's Image of the City (1960), a confirmation of certain linguistic features is found, for in the findings from maps and descriptions of spaces and places, the elements of *node* and *path* are central. I have compared Lynch's node and path connections to the node and link elements of language that have also been identified in cognitive and linguistic studies (Alibrandi, 1993a; 1993b).

Lynch also identified *edges*, *districts* and *landmarks* as elemental to the cognitive construction of landscape as represented both verbally and graphically. While *edge*, *district*, and *landmark* elements of both internal and external representations have clearly spatial meaning, I maintain that parallel functions in verbal representations and products are also present. These are considered in the discussion below, in which participants in this study described and drew such *edges* as "boundaries", such *districts* as region and place, and such *landmarks* as "home."

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[5] In this earlier paper, it was my contention that, "language" and "spatial behavior" could each be viewed as a set of communicative behaviors widely varied, but within their own domains, based upon a system of shared symbols and meanings. "Language" behaviors would encompass many communicative acts originating in a communication system of based upon sound symbols. These may have eventually been translated to alphabetic or pictographic form, but their symbolism is not graphic or spatial in nature. Those behaviors of a "spatial" nature would include the non-verbal actions and operations in space, in art, in geography and geometry. The two distinct sets is exemplified by a drawn map for a friend as compared to the "hard" product of a set of directions written for the same friend. Each draws upon internally stored spatial information, and one external product is a spatial representation, while the other is a verbal (or linguistic) representation.

In various studies using sketch maps, cognitive maps and graphic representations, longitudinal effects of conceptual change have been found (Morine-Dershimer, 1993); Vosniadou and Brewer, 1992; Goodnow, 1977; Alibrandi, 1993b). In the longitudinal studies, with different foci, representational products have yielded certain properties in accordance with the focus undertaken. Morine-Dershimer found strong correlation and predictive value in the cognitive maps produced by pre-service teachers in a methods course when these were compared to other forms of assessment and evaluation (1993). Vosniadou and Brewer (1992) found, through both graphic representations and interviews of first, second, and third graders that a generalized sequence of concepts or mental models of the earth could be constructed from their graphic and verbal representations.

Thus, in considering the maps and representations produced by the participants in this study, I have included both visual representation and verbal description as evidence of conceptual change regarding region and partnership toward understanding processes involved in the co-construction of a social ecology. In addition, the products used to demonstrate conceptual change were produced before and after a particular meeting event (Meeting #6) during which the process and focus of the group underwent a marked shift from its previous meeting procedures and foci.

Data Sources

As indicators of the process of a group's "social ecology," then, I asked the study participants to produce two representations at the time of their individual interviews. The temporal and spatial settings of the interviews cover an eight month period and a one hundred-fifty mile range. Thus the role of the representations as reflecting inner states may have longitudinal implications of conceptual change as well as social-ecological implications given the distance and infrequency of communication between the partners.

In two separate interviews, individual study participants were asked to produce representations of the partnership. These were produced at different times in different parts of the watershed region, and were temporally separated by a period of months and by the intervention of Meeting #6. Meeting #6 appears to have been a "watershed' meeting in

by the intervention of Meeting #6. Meeting #6 appears to have been a "watershed' meeting in terms of process and product for the group. The discussion of Meeting #6 falls under the discussion on "Collaboration," below.

Table 2. Dates and locations of participant interviews, 1995-1996

Participant	Interview #1 Date	Interview #1 Location	Meeting # 6: 12/13/95	Interview. #2 Date	Interview #2 Location
CB	10/95	MA		1/19/96	MA
MLC	5/95	MA/CT		1/18/96	VT
JL	11/95	MA		1/19/96	MA
ML	7/95	MA		1/11/96	MA
AM	9/95	CT		1/24/96	CT
GKN	6/95	MA		1/18/96	MA
SS	5/95	NH		1/18/96	NH
TW	8/95	MA		2/9/96	NY

Representations of Watershed as Region and Place

> Each individual creates and bears his own image, but there seems to be substantial agreement among members of the same group. It is these group images, exhibiting consensus among significant numbers, that interest city planners who aspire to model an environment that will be used by many people.
>
> Kevin Lynch: Image of the City, 1960: 7)

In a study of ten children's spatial cognition, Judy Sachter (1990) analyzed a focus group of three children through two tasks. In my analysis of two representational tasks over two occasions, I focus upon conceptual change regarding region and evidence of social ecological change in the partnership through four individuals. In the two spatial product tasks; the map and the representation of the partnership; I have focused upon the products of four of the partner-participants; two female and two male. Because the participant group was not gender-balanced, I selected this subset as a focus group for this paper.

In the focus group, one male and one female are from Massachusetts, and were the initial organizers of the first partnership meeting. The other male and female hale from different states; he from Connecticut, and she from New Hampshire. The distinctness and completeness of their representational products can be seen to represent the diversity and similarity of products produced by the partners as a whole.

What are your personal connections to this watershed?

With which parts of the watershed are you most familiar?

After responding to these questions, the participants were asked, "Would you please draw a map of the Connecticut River watershed?"

In the second set of interviews, participants were asked at the beginning of the interview, "Would you please draw a map of the Connecticut River watershed?" Following the drawing of the initial map, they were asked several questions about their personal and professional experiences in the Connecticut River watershed as background to establish their ways of knowing the watershed. In addition, several questions were cues to add particular features to the map.

The map tasks were as follows:

Would you please outline on the map the parts of the watershed with which you are most familiar?

Now would you please locate your home using any kind of point symbol.

Please shade in your local community on the map.

Would you please indicate your "service area" on the map?

Subsequent to these questions, I asked questions intended to get as much description as possible about the watershed region, and to define it in comparison to the more local community or region. Thus I asked:

What is your sense of the place the Connecticut River watershed?

How does this differ from your sense of place for your local community?

Not among those prompts were there any requests to locate the watershed in its political context or to outline the watershed boundary. Where the participants may have used such map conventions, they were not specifically requested tasks. The use or non-use of political boundaries becomes a focus in the analysis as a result of comments made in the initial partnership meeting. In that meeting, partners expressed a desire to work "beyond boundaries." Because service area purviews may be factors in partnership and individual involvement, their presence or absence in a representation may provide indicative evidence as to the functional importance and role of political structures in watershed organizations.

Representing Region

Spatial Representations of the Connecticut River Watershed

In the analysis of the sketch maps generated by the participants, I recall Kevin Lynch's findings from the city of Boston, in which two very relevant features are identified as important *"nodes."* These are the topographic features upon which the city was built; Beacon Hill, which Lynch identified as very distinctive and "often felt to be the symbol of Boston, often seen as from a distance" and the Charles River, about which Lynch stated, "Nearly everyone was conscious of the connection to the river." Further, the topography of the incline and slope toward the river for many delineated a "back" and a "front" to the image of Boston (Lynch, 1960).

Because the scale of a single city is problematic in a discussion of a watershed region--especially a region over 400 miles in length and 100 miles in width--Lynch's features of node and path become somewhat problematic. Yet these elements of slope and river as described by Lynch as "seen from a distance" or held "conscious of the connection" are of particular use when watersheds are defined by high points that slope toward central rivers. As well, Lynch's identified sense of "front" and "back" have relevance to the descriptions of watershed. Essentially, the divides along which watersheds are defined represented to the partners the delineation between "in" and "out" of the watershed.

In previous work with adolescents, I found that an awareness of the locations of water bodies as navigational aids was a strategy used in way-finding (Alibrandi, 1993b). The relative locations of water bodies were held in mental representation and utilized as fixed-point navigational aids in spatial operations. Evidence of a similar nature would appear to be necessary to construct a mental representation of a watershed whose dimensions must of necessity be generalized to a rather large-scale map.

When participants in this study drew their map products, they often started with a vertical line indicating the centrality of the river. All of the maps share this feature. Naturally, the participants' map products have been influenced by maps they have seen. At least two images of the Connecticut River watershed had been displayed in the context of meetings and workshops in which many of the participants had presented and attended

sessions. Thus, the reproduction of certain mapping conventions would likely appear in the sketch map products.

In analyzing the sketch maps for this study, I have focused upon the following features and elements:

1. Boundaries; both natural and political
2. Location of tributary rivers
3. Mapping conventions and symbols used to indicate particular features

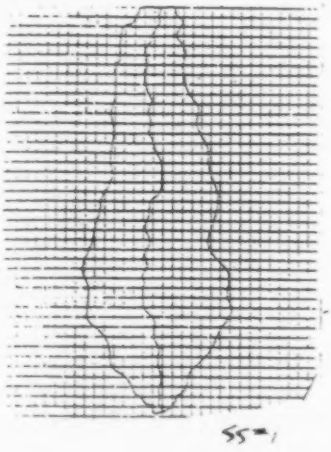
Discussion

1. Boundaries

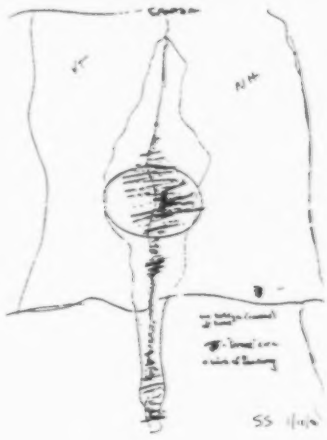
In the focus group pre-Meeting #6 and post-Meeting #6 maps, state political boundary and watershed boundary elements are present. For the states of Vermont and New Hampshire, the river serves as the political boundary between the two. The location of a boundary in or along a river has implications alluded to in interviews regarding the political responsibility for pollution control, regulation, and enforcement.

Of the four focus maps, SS's Map 1 is the most illustrative of just the watershed, its boundaries along the divides, and its central river. SS Map 1 is devoid of political boundary or context. In Map 2, SS has included some political context for the watershed, but in Interview 2, just after having completed Map 2, SS stated, "...if we're going to be successful in teaching people about this watershed, we have to knock those barriers down... haul 'em out of the way--forget about them. And so redefining the region is really important."

Figure 3.



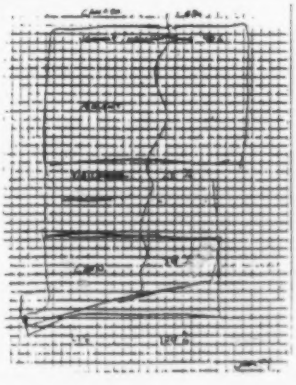
SS Map 1: The Ct. River Watershed 6/95



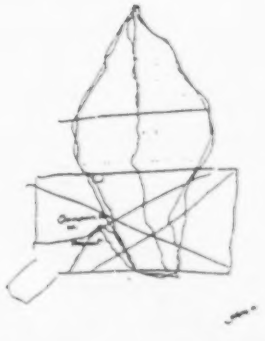
SS Map 2: The Ct. River Watershed 1/96

In virtually the inverse set of representations, AM first indicates the river's presence utterly within the political context. Thus, in AM Map 1, the watershed boundary is absent, but the political borders clearly dominate the representation. By AM Map 2, the watershed boundary is the definitive boundary upon which is superimposed by a Connecticut state boundary. AM added the state map only when asked to draw in his "service area" which for him is the entire state of Connecticut.

Figure 4.



AM Map 1: The Ct. River Watershed 9/95

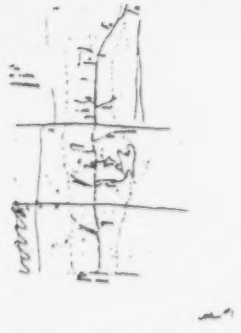


AM Map 2: The Ct. River Watershed 1/96

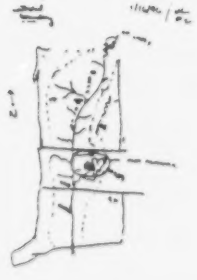
The comparison of these two sets of maps seems to represent an inverse relationship in terms of conceptual change; indicating shifts between natural and political identification. This dilemma is elaborated upon in the verbal data as well.

Both female ML and male TW have fairly articulated maps in version 1 as well as version 2. Both are characterized by a combination of political and watershed boundaries. But, as in the set (AM)+(SS) above, the male TW's map 1 shows considerable political context, some of which is absent in map 2. In comparison, female ML's political context in map 1 is sketchy and less bounded than in map 2. These data suggest variant perspectives across gender lines. Note that male AM and female ML have state "service areas" while the service areas for Male TW and female SS are more diffuse.

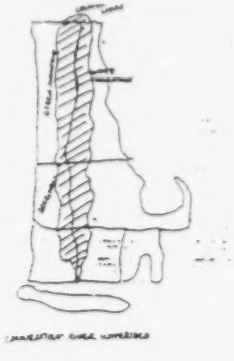
Figure 5.



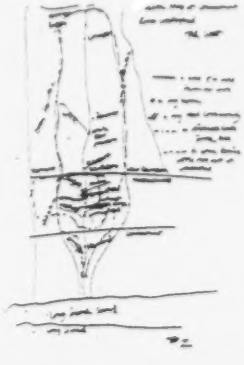
ML Map 1: The Ct. River Watershed 7/95



ML Map 2: The Ct. River Watershed 1/96



TW (m): Map 1: The Ct. River watershed 8/95



TW (m): Map 2 The Ct. River watershed 1/96

In interviews, state-employed educators AM and ML offered these insights:

States ML from Massachusetts,

ML: That's some of the conclusions that I'm coming to with our Merrimack project. If it was a watershed that's say like the Blackstone [with] headwaters in Worcester and it empties out into Rhode Island in the Pawtucket, Woonsocket area...you only have 20-25 communities in the 2-state area. It's a lot easier to do things in an area that size. But I think when you're getting into huge drainages like the Connecticut and the Merrimack, it's a lot more difficult unless you have... region-wide organizations to keep in touch with one another about what's going on in the sub-basins. I think the size is the biggest concern.

MA: Let me ask you this--how do you think territorial issues play out in the partnership? The CRWEI partnership?

ML: I haven't--I don't think that there's any right now. Partly because people seem to have a desire to get to what we all have in common as opposed to what we don't have in common or what we view our--as our "turf." So I don't see that there are really lots of territori-I think that people recognize--I like to think that people are recognizing what each other has to offer in terms of strengths and what they can bring to the partnership.

AM from Connecticut:

AM: Ok. I'm not very familiar with all of the details of the Merrimack project. The problem is, there's too much information out there. There's too many campfires. We're all doing the same thing in many cases. It's very difficult to keep up with all the information that comes to you and you try to see if you can get to have a world that it's small enough that you can handle it, okay? And today's world, with all of the technology and information--especially the electronic information and all that, is so enormous, and--it's just too difficult to handle--especially the networking part. How do I network from these people? How do I choose who is the real--who is the right person I should talk to and who I shouldn't? I mean, I only have 10 minutes before dinner, you know! It's just very difficult. So I think people just decide to zero in on their own little world (draws on paper) everyday. And we have campfires like that everywhere.

MA: Yeah, yeah. Which is something that you mentioned way back in the beginning. So um,

As you reflect on the interaction now, how would you interpret it? What do you see differently now?

AM: With reference to CRWEI? Well, we have grown--not very far, but we have grown since then. We wasted a lot of time. Yeah. We--and this is nothing that has to do with CRWEI itself, it has to do with almost any organization--they want to do something, but they know that they're already so busy doing all the things that they--It's like they want--but they don't--to get involved. So that's what makes it difficult, I mean because you want to have people who have a real commitment over something, and you choose those people that are extremely busy, and they're INTO things. They already have 65,000 committees, they are already involved. So I can hear them--you know "we should do this and we should do that" and I can hear them behind saying, "Am I sure that I'm saying this? I don't really want to get into trouble!"

By comparing their sketch maps and verbal data, we find evidence of the tensions and cognitive dissonance associated in making an additional layer of commitment to a regional partnership. These professionals have overwhelming constraints on their time, energy, and resources. Thus the dissonance is a factor considered by each individual who is by virtue of becoming involved, expanding her or his purview or workload to collaborate in a watershed organization. These tensions and dissonances appear to be reflected in shifts in the partners' representations of the region.

2. Tributaries

The river's source, the Connecticut Lakes, are indicated by ML in each representation, and in Map 1 by TW who also indicates the river's source in Canada. The natural boundary of Long Island Sound is present in the maps of both males and by ML, with the greatest articulation by TW who recently relocated to New York after his position at an environmental education center was eliminated[6].

The location of tributary rivers does not occur in either of the maps by AM or SS, but occur in both of ML's maps, as well as in TW's Map 2. Tributaries represented in these maps are most clearly articulated in the Massachusetts region by ML and TW, Massachusetts residents. This appears to be a conceptual perspective which is neither negated nor enhanced by actual on-the-water experience, which was present across the four featured participants.

Although I have maintained in previous papers that accuracy is not necessarily an understood goal of a sketch map product, there are some thirty to forty major tributaries to the Connecticut River, and several hundred overall. Only selected tributaries have been represented. This indicates the processes of selection and generalization, two mapping conventions that serve to include, exclude, emphasize or underemphasize certain features relative to the space and scale allowed. In this context, only twelve tributaries are represented on the most detailed of any of the watershed educators' maps[7].

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[6] This imminent possibility was one of the factors that motivated TW to call EH and ML about developing a Connecticut River watershed educational initiative in the first place.

[7] This would serve more as a general indicator than an indictment; perhaps the sketch maps of hydrogeologists or cartographers in the region would yield greater definition, but perhaps they would not.

3. Map Conventions and Symbology

Mapping conventions used by the four featured partners included text, shading, border patterns, symbols, map keys, and a north arrow. Here again, AM and SS's maps tend to be the inverse of one another in terms of the presence or absence of text and symbology. ML's Map 1 and TW's Map 2 show remarkable similarities here as well as in their boundary and tributary features.

In light, then, of Lynch's findings about hill, slope, and river, we may see evidence of the mental representations gathering around the concept of watershed held by the partners. In general, these products have become more articulated in version 2, and have begun to appear somewhat more unified.

Verbal Representations: The Place, the Connecticut River Watershed

On the question of place, the descriptive data is in many ways more illustrative than the sketch map data on region. In Table 3, below, are presented condensed responses to the question, "What is your sense of the place, the Connecticut River watershed?"[8]

Responses by the focus group members are situated within the context of all of the participants interviewed. The comments of those not in the focus group appear in the shaded columns, while comments from the four partners in the focus group are highlighted for the sake of simplicity.

[8] I have eliminated my own interjections and feedback to include salient points made by the individuals.

Interview 2 Verbal Representations

Table 3. Individual responses of female (f) and male (m) participants coded by home state.

Question 12. What is your sense of the place, the Connecticut River Watershed?							
CB (f/MA)	MC (f/VT)	JL (m/MA)	ML (f/MA)	AM(m/CT)	GN (f/MA)	SS (f/NH)	TW(m/MA
A sense of it is its--yeah--diversity: major. Cultural as well as natural...And I will say it's an interesting mix of wildness and ownership.	My sense of it? It's a wonderful river. It offers so much. I love being on it...The views from up around here are just spectacular. It's just gorgeous. And yet I know there are problems... water quality and erosion problems, so it's kind of a mixed sense of beauty.	I mean to me it's home--and it has been for most of my life... When I think of the watershed, especially the Mass. part, part of the Conn. part--not so much in VT and NH, but mainly in the Mass. area, I feel like that's home.	Well, I look upon the Ct R valley, which is what sort of comes to mind... is sort of 'where I'm from,' even though where I was actually raised is on kind of a far point on the boundary...I look upon it as 'home'... I also look upon it as a visual picture from the east to the west... the tobacco fields... the vegetable fields...even though there's been so much growth!	I see it as different, geologically speaking. It's a floodplain--big, huge, enormous floodplain...in the state of CT...it has a lot of terrain that is Jurassic ...and you have the dinosaur prints, and you have the Trap rock. It's unique.	It's a place that feels very much at home. I think it's a beautiful place. When I think about it, I think of the farm fields, the barns, and the river... that's my image of it. I think of it as a beautiful area...a strong area in culture--a very progressive area--a very educated and utopic area to live in...the "Happy Valley!"	To me it feels too big to have a sense of place...when you're talking the watershed, it goes upward as far as Canada, and I hear it's very different there--the smells, the sounds, the flowing of the river--its pitch, its depth, its width...we notice that the river is so different in different areas.	Largely rural, forested and pasture-lands to the north and increasingly urbanized and polluted to the south. Largely forested hills and old, weathered mountains. Decreasing biological diversity; increasing human population.

From the focus group, all but one of the issues raised by the group as a whole emerged. First, there was an identity of the watershed as "home." With deeper questions, participants giving this response who were all from Massachusetts section of the watershed, often referred to it as the "Pioneer Valley" or the "Happy Valley," a folk descriptor. Three of the Massachusetts group identified the watershed as 'home,' and of those three, two were raised in that region. The Massachusetts group also shared images of field-and-forest landscapes.

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A sense of "boundary" was evident in deeper questioning as well. From the focus group, ML identifies the perspective from "boundary" toward valley and river; a perspective more visibly represented in the sketch maps. The watershed boundary or divide was often referred to as a place from which the watershed was observed, imagined or represented in memory. The perspective from the watershed divide, while not referred to by this term, was the place participants were positioned as they described the scene of a valley below, stretching to the river.[9]

This perspective and its importance had strong implications for these educators as places and experiences essential for teaching and learning about the concept of watershed. The divides in Massachusetts also held political significance, especially concerning the transfer or diversion of water supply resources from one watershed or basin for consumption in another. In Massachusetts, these transfers occur within the state, as they do in Connecticut. The references to redistribution had political overtones for the Massachusetts partners, where water supplies are redirected from the Connecticut River basin to the population center in the greater metropolitan are of Boston, the capitol. Inter-basin transfer in Connecticut remains within the Connecticut River watershed, as it's destination is to the Hartford area, located on the Connecticut River.

The area's uniqueness and attributes, and the diversity within the watershed were often mentioned. A recognition of the threats to diversity in the way of population growth, pollution, and land use issues accompanied these references. From his unique perspective in CT, male AM describes the outstanding geological feature of the floodplain; and anomaly in the state of CT's otherwise hilly terrain. The Jurassic features he mentions are also present in the MA reach of the river, yet they are perhaps more unusual and marked in their CT context (AM himself is a native of Venezuela, from the Orinoco watershed).

Finally, SS, in seeing so much diversity, expresses that for her, the 11,260-square mile region is too vast, "too big" for her grasp of a unifying sense of place, yet in her teaching, she sees it and represents it to children as a region comparable to "the rainforest." This perspective is particularly noteworthy in its watershed educational implications.

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[9] Clearly from their descriptions as if standing on the divide, the partners conjured Lynch's sense of "front" and "back."

Beyond those issues raised by members in the focus group, two Massachusetts females, CB and GKN, value the cultural assets of the region's educational establishments and resources. They referred primarily to educational and commercial resources in the Massachsusetts reach of the river; the "Pioneer Valley" or "Five College" area.

Summary

The combinations of the sketch maps of the watershed as region and the descriptions of watershed as place raise some dilemmas for watershed partners that have implications for other watershed education initiatives. The participants exhibited tensions and cognitive dissonance between the natural and political boundaries they recognized and represented. There was movement between pre-concepts and later concepts indicated both graphically and verbally. This movement seemed to indicate shifts between perspectives of political versus natural boundaries or prominence. There was some suggestion of gender implications in the emphasis placed on natural versus political boundaries. Because of the limitations of the size and composition of the group, only further study can be implied.

Collaboration

As described, the partners have been meeting since May 13, 1994. Various partners had volunteered to facilitate meetings as the partnership discussed various structural and procedural possibilities. Meetings also served to network the partners whose schedules permitted them little time to "think watershed" in planning their work from the participating agencies.

Table 4. Dates and Locations of CRWEI Partnership Meetings 1994-1995

Meeting #	Date	Location
1	May 13, 1994	Quabbin Reservoir, Belchertown, MA
1a	July 27, 1994	Hitchcock Ctr. for Environment, Amherst, MA
2	Sept. 20, 1994	Northeast Utilities R. E. C. Northfield, MA
3	Nov. 11, 1994	Montshire Museum, Norwich, VT
4	Feb. 8, 1995	USFWS Headquarters, Hadley, MA
5	June 14, 1995	Northeast Utilities R.E.C., Northfield, MA
6	Dec. 13, 1995	USFWS Headquarters, Hadley, MA

Since Meeting #2, the partners had followed a rotated facilitation format and several of the members had acted as facilitators at various meetings. In Meeting #5, on 6/14/95, facilitator KN raised the critical questions, "Why are we meeting? What's our agenda? Do we have an agenda?" Giving voice to some of the frustration felt by various partners, KN's critical questions may in retrospect be seen as the impetus toward moving into a third phase of the partnership.

> "What we really needed to address was, "What are we doing?" "Why are we meeting?"...I felt like I wasn't getting any direction from anyone...there was no agenda...And perhaps it needed to get so frustrating that people were willing to say, "What're we doing?" I felt galvanized after the meeting we just had [Meeting #6]--and perhaps that whole process needed to happen" (KN: 10).

With these critical questions raised in Meeting #5, an onus was placed upon the next facilitator to make a shift in procedure. At Meeting #5, AM volunteered to facilitate the next meeting (Meeting #6). In preparation for Meeting #6, facilitator AM set an agenda of group prioritizing and selection of one of the group's goals as a starting point for developing an implementation plan. This focus on "doing" rather than "talking" was referred to by several participants, and although most had identified "hands-on" approaches to teaching and learning as the most valuable educational methods, they characterized their own previous meetings as "talking."

During Meeting #6, the facilitator and participants used different participation strategies than in previous meetings. Five of the eight study participants referred to this as a marked difference between "doing" something as opposed to "talking about" doing something. Meeting #6, then, was an event in which participation structures emerged that were different in their view from "talking," and for most, represented a marked difference in "where the partnership is headed" (Table 5, below).

a second time for one of the selected options. Each partner also posted his or her single vote on the common tally sheet on the flip chart. In this way, the partners arrived at a project focus, and began to plan implementation strategies for their next meeting.

Summary

In reflecting upon their active participation and shared "democratic" decision-making processes, the partner-participants characterized this meeting as marked in that they felt that they were now "doing" something. There were more positive feelings associated with the progress made in Meeting #6 which appear in both verbal, and as we shall see, graphic representations of the partnership as a result.

Representations of a Watershed Partnership

While participants viewed Meeting #6 as significantly different from previous meetings, it was also the meeting that preceded the Cycle 2 interviews and representational products. Where the Cycle 1 set of interviews and products had been gathered over a more temporally extended period, the spatial distribution was comparable. Thus, as indicated in the chart below, the set (Interview #1) of interviews held prior to Meeting #6 were conducted over an eight-month period, at the convenience of the partners, with one meeting (Meeting #5) occurring within those eight months (see Table 6).

In contrast, the temporal effects of having recently met, and having recently participated in a particularly marked meeting (Meeting #6) may have had some effect upon the representations produced within five weeks of that event. However, the spatial distribution of the participants remained fairly constant in Cycle 1 and 2; in other words, each participant was visited in his or her own home state or preferred location, albeit over a two-week period. Two exceptions are notable, however. Neither ML nor TW attended Meeting #6, yet each produced representations depicted in Figure 7.

Table 6. Temporal Distribution and Location of Production of Representations by Participant

xx MLC SS (MA/NH	x GKN (MA)	x ML (MA)	x TW (MA)	x AM (CT)		x JL (MA)	x CB (MA)	Mtg. #6	xxxx xxxx

Table 5. The verbal data from interview 2 regarding Meeting #6.

Since our most recent meeting, would you describe in general where the partnership is headed?							
CB	MLC	JL	ML	AM	GKN	SS	TW
Well, now we have something to do. And I think the process of voting, putting the stickers on--we needed that.	The last meeting I was encouraged... to see something planned, like a physical project...I think that's what everyone needs in the group to maintain interest. I feel like we're actually doing something, and not just talking about it.	I think at this point, people want to get something done...they want to be more product-oriented...So I think we're getting more sensitive to each other's needs and also to each other's positions.	absent	We made a decision...that is a project that can be done. ..I'm a do-er. I'm not a talker, so you're going to find that that's the way I function. I *do*. Because otherwise, it's just--we can live our lives just talking about it.	At least it's moving! And I characterize moving as in a positive direction. After that last meeting, I feel good about it. So we're moving, so I feel very good about it now, but if you had asked me before that meeting, I would've felt like, "Why bother?"	Well, right now I feel as if it's headed into the design phase.	absent

In her comment, SS notes that she perceives the group as moving into a new "phase," while other partners mark the meeting as "doing" rather than "talking about." The participation mode mentioned by CB, that is, "voting" consisted of an exercise in which AM led the group to select one of its stated goals for the purpose of entering into a project by which that goal could be implemented.

The participation of the partners in co-constructing the methods used to gather input on the various options, prioritize those options, and vote on the prioritized options drew upon their past experiences in such processes. As facilitator, AM declined to record the group's comments on a flip chart. This role was quickly filled by female CB who recorded the discussion of the first objective on the flip chart. For each of the subsequent objectives, other partners volunteered to record. Thus, of the eleven partners present, eight took active ("hands-on") leadership roles.

Once the input on each objective had been recorded, these were posted around the meeting room, and each partner, during the shared lunch, reviewed the options by viewing them gallery-style, then voted for their top three choices on a common voting sheet on the flip chart. After a brief discussion, the partners reviewed the remaining options, and voted

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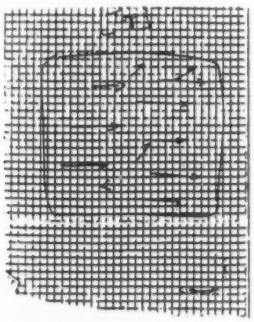
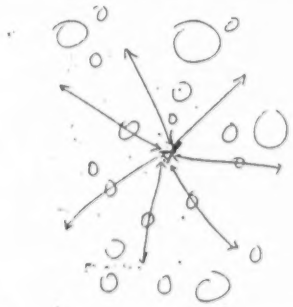
In the comparisons of first and second products, I have again focused on the four participants (AM & TW and SS & ML); two males and two females. In each of these sets, one female and one male were absent from Meeting #6, and had not been in communication with one another during that time. Neither had the female (SS) and the male (AM) been in contact during this time nor had they been in contact with either of the other male (TW) or female (ML)[10].

[10] SS had arranged for a listserve to be opened for discussions of watershed issues of interest to her students and those of schools participating in the NCRV (Networking the Connecticut River Valley) project.

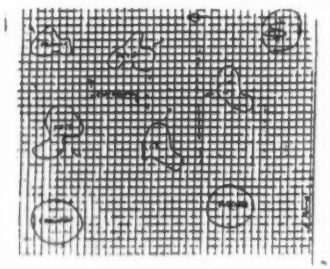
Figure 7.



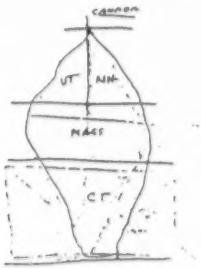
SS (f): Representation 1 (pre-Meeting #6)



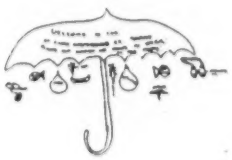
SS (f): Representation 2 (post Meeting #6)



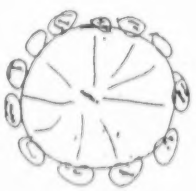
AM (m): Representation 1 (pre-Meeting #6)



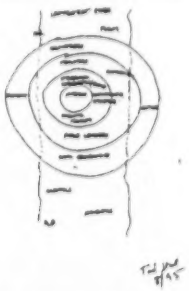
AM (m): Representation 2 (post Meeting #6)



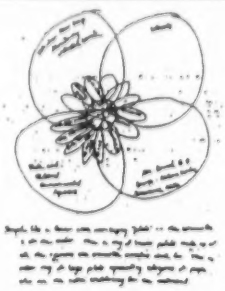
ML (f): Representation 1 (pre-Meeting #6)



ML (f): Representation 2 (post Meeting #6)



TW (m): Representation 1 (pre-Meeting #6)



TW (m): Representation 2 (post Meeting #6)

The two representations of the partnership produced by the two males and the two females are presented in two different combinations. First, in Figure 7 (above) we saw the two products of each of the individual participants, SS, AM, ML, and TW compared pre-Meeting #6 and post Meeting #6.

In the second presentation, all four pre-Meeting #6 representations are presented together, and all four post-Meeting #6 representations are presented together in Figure 8.

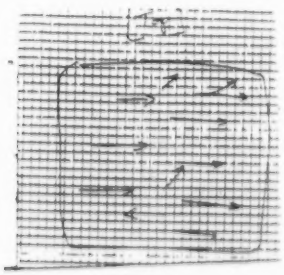
In order to analyze these representations as a group, I selected three major features. The features upon which I have focused are:

1) the overall design of the representation;

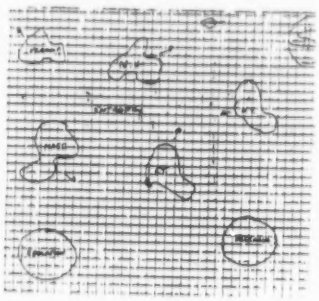
2) the elements used to represent the partners or elements of the partnership; and

3) the distance or space between the elements and their spatial relationships to one another.

Figure 8.

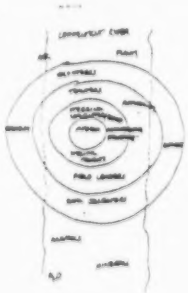


SS (f): Representation 1 (pre-Meeting # 6)



AM (m): Representation 1 (pre-Meeting #6)

ML (f): Representation 1 (pre-Meeting #6)

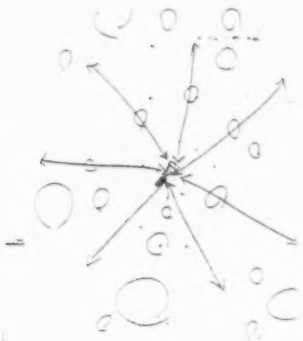


TW (m): Representation 1 (pre-Meeting #6)

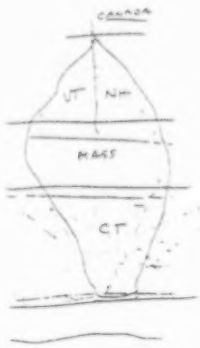
In the pre-Meeting #6 group, there is much greater diversity in the designs and placements of the design elements. There also appears to be a greater distance or space between those elements, and they do not appear to be connected in any way. In fact, some are in effect, floating, and where arrows are used, they are sometimes shown indicating different directions.

In contrast, the representations produced in January, 1996, after Meeting #6 appear to convey greater cohesion of overall design (Fig. 9). In three out of the four in the focus group, there is a distinctly circular pattern. The elements of the designs appear to have greater uniformity of function. For example, in AM's first representation, the word entrophy [sic] is used to label the space in which his other elements are floating. These elements are such things as money, states, research, and education. In AM's second representation, there is cohesion among the states within a bounded, watershed map-shaped design.

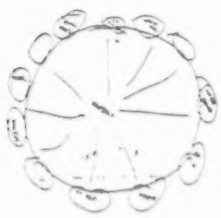
Figure 9.



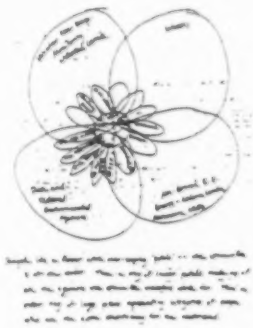
SS (f): Representation 2 (post-Meeting #6)



AM (m): Representation 2 (post-Meeting #6)



ML (f): Representation 2 (post-Meeting #6)



TW (m): Representation 2 (post-Meeting #6)

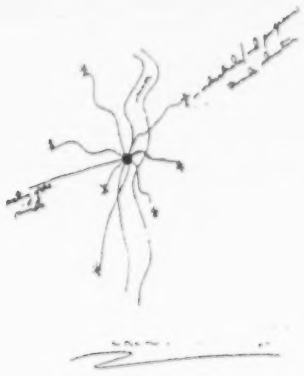
The elements in the second group of representations appear to have spatial relationships of greater consistency and cohesion. Several of the second set indicate connections through arrows or spokes in a radial pattern from a strong central element. Note that the arrows and links in the post Meeting #6 group area used to connect elements as opposed to those in the pre-Meeting #6 group, which indicated misdirectedness.

Overall, the pre-Meeting #6 representations display more individual styles and concepts of the partnership, while the post-Meeting #6 representations display greater similarities in the specific design elements, their relationships within the design, and in a tendency toward a central/radial design. In addition, the coherency of the overall designs is greater, with a higher frequency of a circular pattern in the post-Meeting #6 group. This consensus of design found in the select male/female group is enhanced when the four additional post-Meeting #6 representations are displayed (Fig. 10).

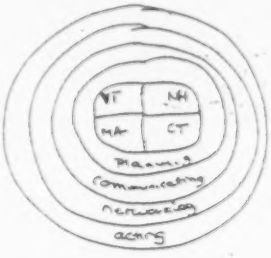
In the final group of post-Meeting #6 representations, most of the designs have radial centers and connections, with cross-connections indicated by arrows and links. Across these representations, distinctions in the specific elements represented highlight individual concepts of the internal elements of the partnership, but an overall consensus of design seems to be the dominant theme.[11]

[11] In refining this analysis, I consulted with art and design professionals and educators who shared their responses to this set of representations. Three of the four consulted confirmed my analyses adding that between the pre-Meeting #6 and post-Meeting #6 sets there was less chaos or randomness, a greater representation of systems, and stronger and more reciprocal connections between elements. The fourth reviewer saw distinctions and made judgments on designs which evoked universal designs that pleased her from the post-Meeting #6 set.

Figure 10.

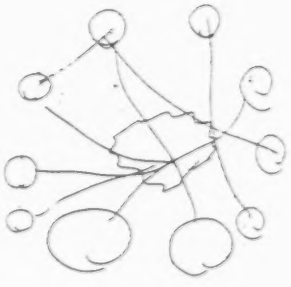


MC (f): Representation 2 (post-Meeting #6)



CB (f): Representation 2 (post-Meeting #6)

JL (m): Representation 2 (post-Meeting #6)



GKN (f): Representation 2 (post-Meeting #6)

Summary

Taken as sets of pre- and post products, these representations appear to reflect a process of social cohesion. This transformational process has resulted in sets of products which have implications regarding unspoken but cognitive understandings of the partnership. The products depicting the partnership display a greater sense of cohesion than the products reflecting the watershed as region, where tensions between natural and political boundaries still remain.

How are these findings interpreted in light of the original question regarding conceptual change in the social construction of watershed? If we can accept the partners' representations as indicators of conceptual change, certain processes become visible. First, the process of social construction of "partnership" seems to have coalesced as the partners

focused upon a common action project. Greater coherence appears to have occurred in the social relations while representations of region still demonstrate dissonance and tension, reflecting political issues related to political boundaries. As the partners had sought to "overcome boundaries," so have they proceeded in the context of the partnership.

Implications/Significance

Included in my original question was whether the processes of social construction within a regional partnership might reflect the broader social construction of watershed-as-region. The study would imply that collaborative efforts among regional partners has established a greater sense of coherence than other existing constructs, either political or spatial. For educators, these findings would imply that collaborative projects actively and selected by participants serves to cohere the construction of watershed initiatives.

While the study indicates that cognitive representations of watershed region are influenced by persistent political boundaries, and that the tension between natural and political boundaries remains even while collaborative efforts are in process. Given the layers of political statute and bureaucracy, this seems quite logical.

While further study of concepts of watershed-as-region are indicated, it appears that democratic collaborative educational initiatives produce a more coherent approach to watershed issues. It is relevant to note here that no one organization or individual has dominated the partnership's process to this point. The partners have shared power and responsibility in their formative years. This may represent a critical feature for interstate regional watershed education partnerships.

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